

REMARKS

Claims 1-12, 23 and 25 are presently pending in the above-identified patent application. Claims 13-22, 24 and 26 have been canceled without prejudice. In the final Office Action, the Examiner finally rejected claim 4 under 35 U.S.C. §112, first paragraph, for both an alleged lack of enablement and for a lack of a written description. As provided below, the Examiner has subsequently withdrawn both of these rejections. The Examiner finally rejected claims 1-12 under 35 U.S.C. §112, second paragraph, alleging that the phrase “candidate sequence” and the term “patterns” cause claims 1, 2, 5 and 25, and claims dependent thereon, to be vague and indefinite. The Examiner also finally rejected claims 1-8, 10-12, 23 and 25 under 35 U.S.C. §102(b) as allegedly unpatentable over the article entitled “GenBank” by Benson et al. (hereinafter “Benson”).

The present invention has been described in Applicants’ prior response, incorporated by reference herein.

Applicants thank Examiner Ly and Examiner Marschel for the telephone interview conducted on February 10, 2004. In that interview, Examiner Ly indicated that the rejections of claim 4 under 35 U.S.C. §112, first paragraph, for an alleged lack of enablement and lack of a written description, as highlighted above, have been withdrawn. Further, Examiner Ly indicated that the Information Disclosure Statement, filed by Applicants on May 22, 2003, due to an oversight, has been received but has not been considered. The Examiner indicated that it will be considered during examination of the present action.

In the present action, the Examiner finally rejected claims 1-12 under 35 U.S.C. §112, second paragraph, maintaining that the phrase “candidate sequence” and the term “patterns” renders claims 1, 2, 5 and 25 vague and indefinite. The Examiner alleged that it is unclear what criteria are being used to determine that a sequence is a candidate sequence. There appears to be some discrepancy between several of the statements present in the Office Action. The Examiner first indicated that claims 1-12 are rejected, and thus found claims 3, 4 and 6-12 rejected as being dependent from claim 1. See, Office Action, paragraph 14. The Examiner subsequently, however, included claim 25 in the rejection. See, Office Action, paragraph 16. Applicants assume that the Examiner intended to include claim 25 in the rejection and have directed the remarks as such.

Applicants respectfully submit that, given the description provided in the specification and knowledge common to those of ordinary skill in the art, use of the terms “candidate sequence” and “patterns” do not render the claims vague and indefinite. Namely, the concept of a candidate sequence,

as well as which sequences are considered candidate sequences, are well presented in the specification so as to convey to one of ordinary skill in the art the scope of this limitation.

By way of example only, the present invention provides techniques for determining additional members for a family. The family is initially defined through exemplary sequences. See page 6, lines 5-7 of the specification. Additional members may be determined by analyzing candidate sequences, e.g., candidates for inclusion in a particular family. See page 8, lines 11 of the specification. For example, a composite descriptor may be used to determine if a candidate sequence is part of a family. In an exemplary embodiment, the composite descriptor may be used to search a database of sequences, e.g., a database of candidate sequences, to determine if individual sequences in the database are members of the family described by the composite descriptor. See page 9, lines 14-18. Thus, Applicants respectfully submit that one of ordinary skill in the art, given the present teachings, would be able to readily ascertain the metes and bounds of the present claims and would not find the concept of a candidate sequence, as presented herein, to be either vague or indefinite.

In regards to the term “patterns,” Applicants respectfully submit that the specification also clearly sets forth the concept of patterns, and how patterns are used to determine if a candidate sequence(s) is a member of a particular family so as to allow one of ordinary skill in the art to determine the scope of the present invention. By way of example only, patterns are discovered that are common to some, or all, of the sequences in a set of sequences (which could include all of the family members). See, page 6, lines 12-15 and page 9, line 5 of the specification. For example, a training set of family members may be searched to determine common patterns between some or all of the family members. See page 8, lines 12-14 of the specification. The statistically significant and common patterns may become part of a composite descriptor. See page 9, lines 3-4. The composite descriptor may then be used to determine whether a candidate sequence(s) is part of a family, as described above. Thus, Applicants also respectfully submit that one of ordinary skill in the art, given the present teachings, would understand the concept of patterns and how patterns are used to determine whether a candidate sequence(s) is part of a family and would be able to readily ascertain the metes and bounds of the present claims and would not find the concept of patterns, as presented herein, to be either vague or indefinite.

#### PRIOR ART REJECTIONS

The Examiner finally rejected claims 1-8, 10-12, 23 and 25 under 35 U.S.C. §102(b) as allegedly unpatentable over Benson. Applicants respectfully submit that Benson does not teach

limitations present in each of independent claims 1 (from which all pending dependent claims ultimately depend), 23 and 25. Namely, Benson does not teach discovering patterns or determining if a candidate sequence comprises the patterns. Benson, therefore, also does not teach determining if a candidate sequence comprises a predetermined number of patterns.

5 Benson discloses GenBank, a public database of all known nucleotide and protein sequences with supporting annotation. See Benson, page 1. The Examiner pointed out that Benson teaches clustering. For example, the UniGene collection of unique human genes creates clusters of sequences that share virtually identical 3'UTRs. See, Benson, page 2. Respectfully, Applicants do not see how clustering together sequences having identical regions anticipates discovering patterns. Benson  
10 teaches clustering as a way to reduce the number of individual sequences in the database. Benson does not teach the step of discovering patterns.

Even if it is presumed that the clustering action described in Benson relates in some way to pattern discovery, Benson certainly does not teach determining whether a candidate sequence comprises certain patterns. The Examiner highlighted that Benson discloses that the BLAST family of  
15 programs may be employed for similarity searching (one of the most frequent uses of GenBank). See Benson, page 5.

The BLAST family of programs have been described in Applicants' prior response, incorporated by reference herein. Clearly BLAST does not determine whether a candidate sequence comprises certain patterns. In fact, BLAST, as described in Applicants' previous response, is a query-  
20 driven method wherein a query sequence is processed to form k-tuples which are then compared to database sequences. Nowhere does BLAST search for patterns in the candidate sequence.

Further, since Benson does not disclose determining whether a candidate sequence comprises the patterns, Benson also does not teach predetermining the number of patterns the candidate sequence should comprise. There simply is no such teaching of this limitation in Benson.

25 Since the teachings of Benson do not disclose all limitations of Applicants' independent claims 1, 23 and 25, such claims are allowable. As claims depending from an allowable claim, dependent claims 2-8 and 10-12 are also allowable. However, Applicants also assert that said dependent claims recite patentable subject matter in their own right. Therefore, Applicants respectfully request reconsideration and withdrawal of the rejections, and allowance of the claims.

30 In view of the foregoing, the invention, as claimed in claims 1-8, 10-12, 23 and 25, cannot be said to be either taught or suggested by Benson. Accordingly, Applicants submit that all of

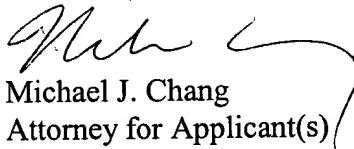
the pending claims, i.e., claims 1-12, 23 and 25, are in condition for allowance and such favorable action is earnestly solicited.

If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this application, the Examiner is invited to contact the undersigned at the  
5 telephone number indicated below.

The Examiner's attention to this matter is appreciated.

As indicated previously, a Notice of Appeal is submitted concurrently herewith.

Respectfully submitted,



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